

# Phonetic Convergence of Students from Limburg in Utrecht: (De)voicing of /v/ and Hard and Soft /ɣ/

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## ABSTRACT

Phonetic convergence refers to speakers' tendency to imitate other's pronunciation. This convergence has been demonstrated for both interlocutors within conversations (e.g. Pardo, 2006) and for groups of speakers over longer periods of time (e.g. Quené et al., 2017). While previous studies have established convergence in different time-related contexts, few studies have yet considered what kind of variables are taken up in convergence and what factors influence this. The current study considers the potential convergence of students of Utrecht University who grew up in the south of the Netherlands (Limburg) to fellow students who grew up in or around Utrecht. This was investigated on the basis of a less salient feature, the (de)voicing of /v/, and a more salient feature, the hard and soft /ɣ/ distinction. Participants were recorded while reading out a word list and answering selected open questions. The latter was not only used for analysis of /v/ and /ɣ/, but also provided information on factors possibly influencing convergence. Results indicated that one of four participants originally from Limburg regularly devoiced /v/, similar to participants from Utrecht, whereas one other participant consistently produced a uvular /ɣ/. Register (word-reading task vs interview) did not appear to be a relevant factor. Time of residence and language attitudes are suggested to play a role in convergence.

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## 1. Introduction

Multiple studies have investigated speakers' tendency to imitate each other's pronunciation, a phenomenon known as phonetic convergence. This convergence has been demonstrated for both interlocutors within conversations (e.g. Pardo, 2006) and for groups of speakers over longer periods of time (e.g. Quené, Orr, & Van Leeuwen, 2017). The study of convergence gives insight into the interaction between speech perception and production (see Pardo, 2006). While convergence has been found in different time-related contexts, few studies have considered which variables influence the extent to which convergence takes place. Pardo, Gibbons, Suppes and Krauss (2012) found that reported closeness to the interlocutor correlates with degree of convergence, suggesting that attitudinal factors play a role. Besides attitude, the current study also investigates register as a factor possibly influencing convergence.

The current pilot study investigates phonetic convergence within the Dutch student community in Utrecht. The focus is on the realisation of /v/ and /ʏ/ by students who were born and raised in the province of Limburg (the most southern province) but who had been living in Utrecht for at least half a year. Previous studies suggest that devoicing of /v/ is less strong in Limburg than in more northern areas like Utrecht (e.g. Van de Velde, Gerritsen & Van Hout, 1996; Pinget, 1996). The degree of voicing of /v/ was thus considered to be an adequate measure of possible phonetic convergence. The realisation of /v/ was chosen as speakers are generally not aware of the different realisations regarding voicing. This contrasts with the realisation of /ʏ/, which is more salient. In Limburg /ʏ/ has a (palato)velar pronunciation, whereas northern areas are characterised by a uvular realisation (e.g. Van de Velde, Van Hout & Gerritsen, 1997; Van der Harst & Van de Velde, 2008). Investigating both the (de)voicing of /v/ and the realisation of /ʏ/ will provide insight into what kind of variables are taken up in convergence in different contexts. Fricative realisations were assessed for a word-reading task and a sociolinguistic interview. The interview also collected attitudinal information, which was employed in a qualitative analysis of the data.

Results indicated that one of four participants originally from Limburg regularly devoiced /v/, like participants from Utrecht, whereas one other participant consistently produced a uvular /ʏ/. Register did not appear to be a relevant factor. We suggest time of residence and language attitudes play a role in convergence.

## 2. Theoretical background

### 2.1 Phonetic convergence

In 1981, Trudgill found that his pronunciation shifted towards that of the person he was interviewing. More than twenty years later, Pardo (2006), investigating convergence on a larger scale, found that interacting speakers increase their similarity in phonetic repertoire. This can be explained by the social function of language, as it could for instance “contribute to mutual comprehension and/or rapport through a decrease in social distance” (p. 2391). Whereas her study demonstrates convergence within conversational interaction, Pardo suggests that further research is needed to investigate this phenomenon across speaker communities. She also argues that phonetic convergence “can form the basis for phenomena such as accent change and dialect formation” (p. 2382).

In recent years several studies have examined phonetic convergence over longer periods of time and in community contexts. Student populations are well suited for investigations into convergence, as they usually consist of people from a variety of origins and backgrounds. For example, Pardo et al. (2012) consider phonetic convergence in pairs of college roommates from different regions in the US over the course of one academic year. Their findings were variable and correlated moderately with the self-reported closeness of the relationships. Some participants indeed showed longer-term adjustments in their phonetic repertoire. A longitudinal study by Orr et al. (2011) looked at phonetic convergence in native and

non-native speakers of Dutch and English attending University College Utrecht, throughout their three-year period of undergraduate study. The results show that the Dutch speakers had converged in their pronunciation of /s/ in both Dutch and English (Quen  et al., 2017). These studies suggest that phonetic convergence indeed takes place on a larger scale and may lead to more permanent changes in pronunciation. The present study extends previous investigations by investigating convergence of students from Limburg towards the pronunciation of local students in Utrecht.

## 2.2 The devoicing of /v/

The devoicing of voiced fricatives is a change affecting both Northern Standard Dutch (NSD), spoken in the Netherlands, and Southern Standard Dutch (SSD), spoken in Flanders. Van de Velde et al. (1996) analysed archived radio-recordings from 1935-1993, finding that in both NSD and SSD the devoicing of /v/ increased during this time period, although the increase was weaker in SSD than in NSD. Van de Velde and Van Hout (2001) investigated the devoicing by Dutch language teachers in a reading task. Again, the primary different regions looked at were the Netherlands and Flanders, but regional variation within the Netherlands was also considered. Results indicated that /v/ was devoiced least often in the south. A recent study by Pinget (2015) studied the perception and production of the labiodental fricatives by 18- to 28-year-olds from different regions. She found more voicing of /v/ in Limburg than in other regions in the Netherlands. These results provide good reason to believe that /v/ is more voiced in Limburg than in Utrecht. Pinget (2015) also found more devoicing in the case of a word reading task than in the case of spontaneous speech. The difference in results could be due to devoicing being considered part of the standard nowadays. A word reading task provides greater opportunity for reflection upon pronunciation, and thus more standard language may be used.

## 2.3 The pronunciation of /ɣ/

Although the difference between the Northern ‘hard g’ and the Southern ‘soft g’ is well known, few researchers have investigated this topic. Another paper on the radio study described earlier considers the realisation of /ɣ/. Van de Velde, Van Hout and Gerritsen (1997) investigated several linguistic variables, including the place of articulation and scrape of /ɣ/, and found that the pronunciation in NSD became harder in the period investigated, especially towards 1993. This means that /ɣ/ is pronounced further back (i.e., uvular) and with heavy scrape, instead of a softer velar or palato-velar pronunciation. Van de Velde et al. suggest these changes first took place in middle- and upper-class speech in the larger cities in the Randstad area, including Utrecht (p. 384). A more recent study by Van der Harst and Van de Velde (2008) investigating the pronunciation of /ɣ/ by teachers of Dutch has demonstrated a difference between the Randstad region and Limburg. Although the /ɣ/ is voiceless throughout the Netherlands, the results show a clear distinction in place of articulation and scrape above and below the great rivers. In the regions Randstad, Northern Netherlands and Middle Netherlands,

the uvular /ɣ/ with scrape is mostly used, whereas in Limburg, velar and palato-velar fricatives are most common.

In summary, previous studies have demonstrated different norms for the pronunciation of /v/ and /ɣ/ between Limburg and the Randstad, as well as speakers' tendency to converge to the pronunciation common in their surroundings. The current study therefore investigates if students from Limburg adapt their pronunciation of the aforementioned sounds to the pronunciation common in Utrecht. We considered students' production of these fricatives in the reading of a word list and in an interview.

### 3 Research questions and hypotheses

We aimed to answer the following research question: Do students from Limburg living in Utrecht demonstrate phonetic convergence towards the pronunciation of Standard Dutch in Utrecht regarding the (de)voicing of /v/ and the pronunciation of /ɣ/? Two subquestions were considered: (1) Does the degree of convergence depend on the register? (2) Is there within-group variance, and can this be explained by sociolinguistic factors?

Based on studies of phonetic convergence among student populations by Pardo et al. (2012) and Quené et al. (2017), we hypothesized that students from Limburg living in Utrecht converge towards the Randstad pronunciation, as demonstrated by a similar extent of (de)voicing of /v/ as speakers raised in Utrecht, as well as a hardening of /ɣ/. Based on Pinget (2015), we expected participants to demonstrate more devoicing in a word list reading than in spontaneous speech. As words are presented in isolation in the word reading task, it might be difficult for participants to produce voicing from the start of the fricative onwards. Additionally, as the interview concerns continuous speech, voiceless fricatives may be harder to produce due to coarticulation (Pinget, 2015, p. 46). Participants were expected to use a harder /ɣ/ in the word list reading than in the sociolinguistic interview, because of a possible greater focus on standard pronunciation in the word list, with hard /ɣ/ generally being considered more standard in the Netherlands than soft /ɣ/ (Van de Velde et al., 1997). As for the second subquestion, within-group variance was expected, which would be explained by sociolinguistic differences between participants including the duration of residence in Utrecht and language attitudes. This means that participants who had lived in Utrecht for several years had converged more than participants who had moved there more recently, and that negative attitudes towards a Limburgian accent would increase degree of convergence.

## 4 Methodology

### 4.1 Participants

The participants of this pilot study were seven students living in Utrecht, all native speakers of Dutch. Four students grew up in central Limburg, forming the experimental group; the other three students were raised in or nearby Utrecht, forming

the control group. The students who had moved to Utrecht had not lived in any provinces other than Limburg and Utrecht. They had lived in Utrecht for varying periods of time, ranging from half a year to three and a half years. Previous studies found evidence of convergence within the year (e.g. Pardo et al., 2012), thus students who had not lived in Utrecht for multiple years could possibly demonstrate convergence. Length of residence is considered as a variable in the qualitative analysis. For detailed demographics of the participants see appendix A.

#### 4.2 Materials

A word list and a sociolinguistic interview were designed to assess phonetic convergence. The word list consisted of 50 randomized items (appendix B). 10 of these items were designed to measure the realisation of /v/ and 19 were included to measure the pronunciation of /ʏ/.<sup>1</sup> For both /v/ and /ʏ/ we considered the position of the fricative and whether the syllable containing the fricative was stressed (see Tables 1 and 2). It was deemed important to code for the aforementioned variables to enable comparison with the spontaneous speech data, where fricatives could appear in any of these environments. To avoid coarticulation of /ʏ/ with other consonants, target words were chosen such that /ʏ/ was preceded or followed by a vowel.

Table 1

*Examples of the conditions for /v/ in the word reading task.*

	<b>Initial /v/ (n=5)</b>	<b>Medial /v/ (n=5)</b>
Unstressed	Vakantie	Graven
Stressed	Vinden	Activisme

Table 2

*Examples of the conditions for /ʏ/ in the word reading task.*

	<b>Initial /ʏ/ (n=7)</b>	<b>Medial /ʏ/ (n=5)</b>	<b>Final /ʏ/ (n=6)</b>
Unstressed	gezond	jarige	handig
Stressed	gasfornuis	legaal	bedrag

A sociolinguistic interview (appendix C) was designed to elicit spontaneous speech. The interview simultaneously elicited data on participants' attitudes and awareness of possible convergence. These data were considered relevant for the analysis of results of the experimental group. For the control group, the questions specific to having moved were replaced by other questions.

Materials for the two tasks were combined in a PowerPoint presentation, with the

<sup>1</sup> The experiment was also designed to consider potential devoicing of /z/ (10 items) along with the devoicing of /v/, but these data are not discussed in the current paper considering it is not clear whether this variation follows the expected regional pattern (Van de Velde & Van Hout, 2001). The remaining 11 items were fillers.

word list preceding the interview. The wordlist was presented one word per slide such that participants had to pause the articulation and phonetic assimilation could not take place from one word to the next. The interview was presented with one question per slide such that participants took their time and remained unaware of the purpose of the study for as long as possible.

### 4.3 Procedure

Participants were recorded in a soundproof room with a microphone (Sennheiser ME-64). The PowerPoint was presented on a computer screen. Participants used the mouse to click through the slides. Prior to the tasks, instructions were displayed on a slide. The participants were instructed to take their time with the tasks and to correct themselves in case of mispronunciations. Regarding the interview, participants were instructed to answer as accurately as they could and to use full sentences. Audio was recorded using the Audacity software (Audacity Team, 2018).

### 4.4 Analysis

For both the wordlist and the interview, the instances of /v/ and /ɣ/ were annotated using Praat (Boersma & Weenink, 2018). Based on auditory analysis, relevant instances of /v/ (i.e. excluding ones that are standardly devoiced regardless of region) were coded as voiced, partially voiced, or voiceless, and /ɣ/ was coded as (palato-)velar or uvular. The uvular articulations of /ɣ/ were also coded for scrape using the three-way distinction ‘no scrape’ (ns), ‘light scrape’ (ls) and ‘heavy scrape’ (hs). Scrape, which is caused by vibration of the uvula, is easily audible and reflected by sound waves on the spectrogram. For each participant the interview was transcribed in Dutch.

The results of the experimental group and the control group were compared for the word list and the sociolinguistic interview. In addition, the results of the two tasks were compared and the within-group variation of the experimental group was determined. However, due to the small sample size of this pilot study, no statistical test could be performed. Information from responses to the sociolinguistic interview was used in a qualitative analysis of the results on fricative realisations.

## 5 Results

### 5.1 Word Reading Task: /v/

In the word reading task, the overall percentage of voicing was 46.25 for the experimental group and 28.33 for the control group. These percentages were calculated as follows: if /v/ was voiceless, it was scored 0, if it was partially voiced 1, and if it was voiced 2; subsequently the sum was taken, and the percentage of the total possible points was calculated. Individual results show that the overall pattern does not hold for all participants. Figure 1 presents the percentage of voicing per participant (experimental group: E1-E4, control group: C1-C3). The higher voicing of /v/ for the experimental group holds for participants E1, E2, and E3, while participant E4 frequently devoices /v/.

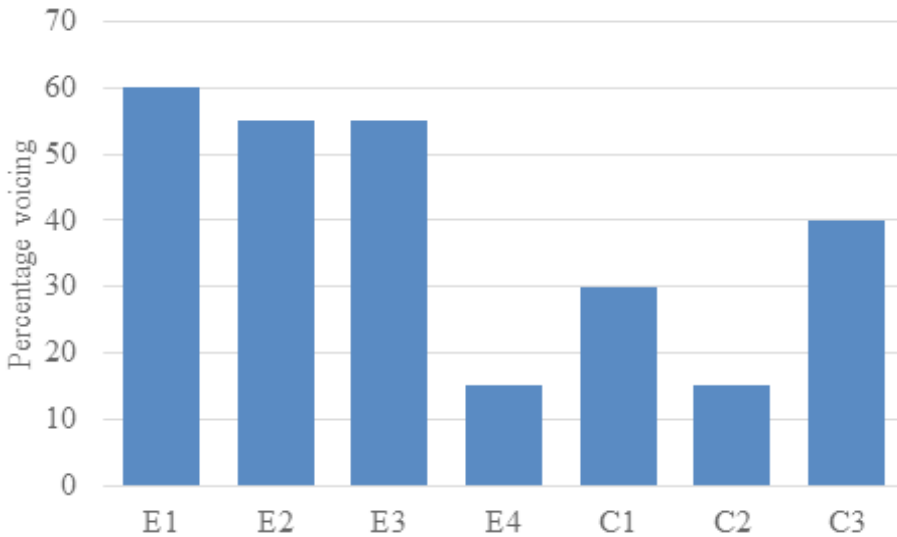


Figure 1. Percentage of voicing of /v/ per participant for the word list.

### 5.2 Sociolinguistic interview: /v/

For most participants the first 10 relevant words with /v/ were analysed. This number was not met by participant E2 and participant C1, for whom 9 and 6 items were found respectively. Overall, the percentage of voicing was 46.15 for the experimental group and 7.69 for the control group. At group level, there was no difference for the experimental group between registers. Figure 2 presents the voicing per participant in the interview. More devoiced realisations of /v/ were found for participant E2 compared the word list reading, and thus the difference from the control group is smaller. Additionally, participant E4 again performs like the control group, while participant E1 and E3 do not.

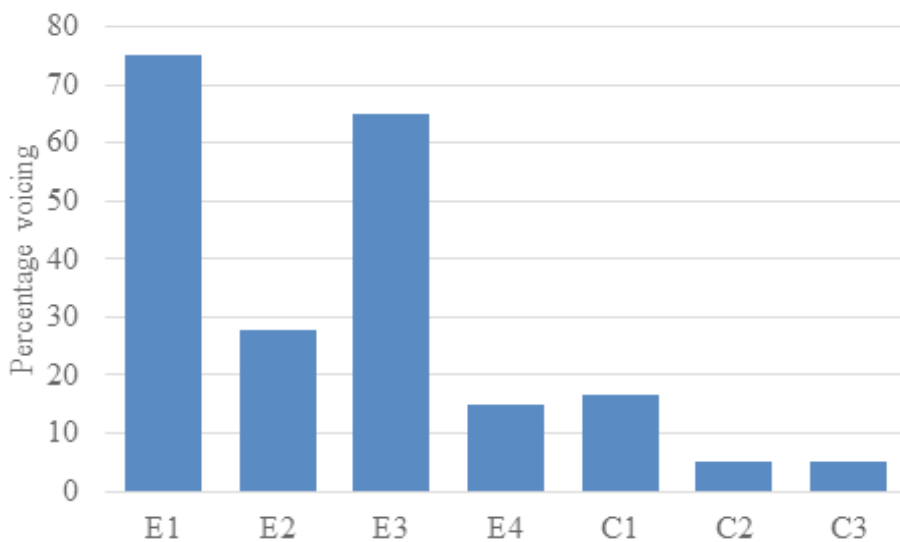


Figure 2. Percentage of voicing of /v/ per participant for the interview.

### 5.3 Word Reading Task: /ɣ/

Results for /ɣ/ in the word list reading are given in Figure 3. Overall, the pronunciation of the experimental group had not converged towards the control group. Three of the participants in the experimental group used almost exclusively (palato-)velar variants of /ɣ/. One of them used a single uvular articulation. As expected, all participants in the control group used only uvular articulations. One of the participants in the experimental group (E3) used exclusively uvular pronunciations as well, although he produced fewer articulations with heavy scrape than the control group participants.

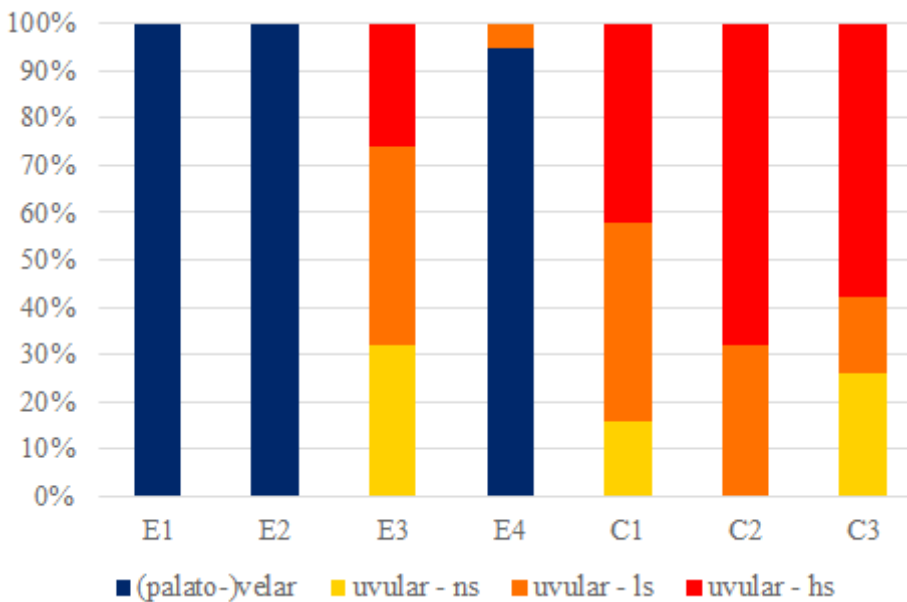


Figure 3. Realisation of /ɣ/ in percentages per participant for the word list.

### 5.4 Sociolinguistic interviews: /ɣ/

The sociolinguistic interviews (Figure 4) again show that the group of students from Limburg in general had not converged towards the control group regarding their pronunciation of /ɣ/. As in the word reading task, three participants of the experimental group produced a (palato-)velar /ɣ/, whereas participant E3 had a uvular pronunciation, like the control group. The participants with uvular articulations used more scrape in the interview than in the reading task. In other respects, the results are similar; again, the participant from Limburg who had a uvular /ɣ/ produced fewer words with heavy scrape compared to the control group.



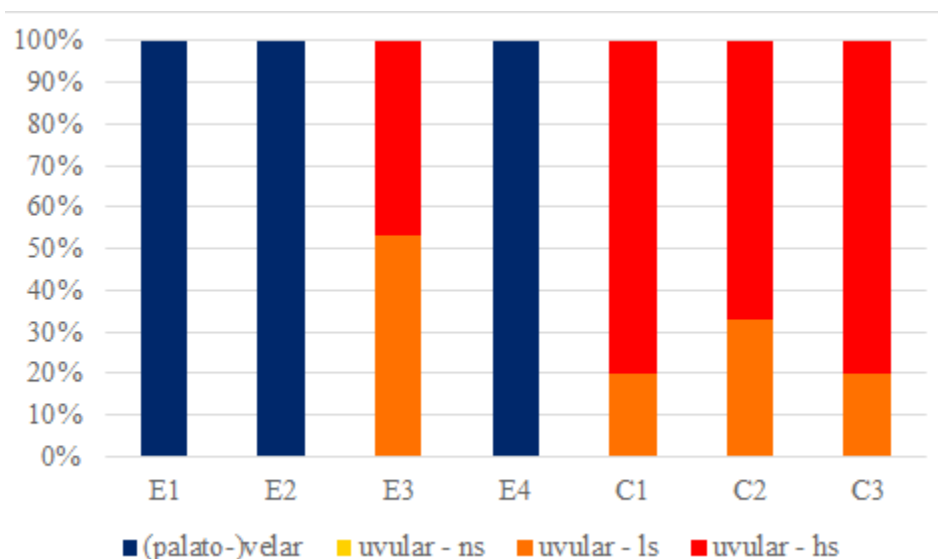


Figure 4. Realisation of /v/ in percentages per participant for the word list.

### 5.5 Sociolinguistic Interviews: The Responses

The sociolinguistic interviews provided information regarding the participants' social circles, their attitudes towards different accents, and awareness of their own potential accent change. The participants were aware that their speech was highly influenced by their place of origin. They all expressed awareness of prejudices towards accents, and they particularly discussed the fact that the accent of Utrecht (or the Randstad in general) was more widely accepted than more peripheral accents like the Limburgian accent. Some participants of the experimental group also mentioned specific characteristics of their speech that had changed since they moved to Utrecht, which demonstrates awareness of phonetic convergence. Appendix D<sup>2</sup> provides a summary of the answers per participant.

## 6. Discussion

The current pilot study was designed to investigate whether students who had moved to Utrecht from Limburg had adapted their accent based on their current environment. Comparison of the experimental and control group did not offer concrete evidence for convergence. Regarding the (de)voicing of /v/, participants' individual results indicate that participant E4 may have converged in his pronunciation of /v/. Participant E4 devoiced regularly in both the word reading task and the sociolinguistic interview, patterning with the control group. Participant E2 produced largely voiceless realisations in the interview but appeared to converge only in this task. The results contrast with what was expected based on Pinget (2015) regarding task type. The participant's stronger devoicing in the interview may be explained by the high number of words with initial /v/ selected. Previous studies

have found stronger devoicing in initial position (e.g. Van de Velde, Gerritsen & Van Hout, 1996). In summary, it appears that participant E4 is the only participant who has converged in the realisation of /v/, which was the case independent of register.

Results on the pronunciation of /ɣ/ indicate that only one of the four speakers from Limburg had converged towards a uvular realisation. The other three participants from Limburg retained a (palato-)velar pronunciation. The expected within-group variance was thus confirmed. Considering the degree of scrape used by participant E3 and the participants in the control group, it can be concluded that although the speaker from Limburg had obtained a uvular pronunciation of /ɣ/, he used less scrape than the control group speakers, indicating that his /ɣ/ was still somewhat softer. The word reading task and the spontaneous speech from the interviews generally gave similar results. However, contrary to what was expected regarding possible differences in register, speakers with a uvular place of articulation used heavier scrape in natural speech than in the word list. In other words, when speakers focus on the articulation of a specific word, they sometimes produce a softer /ɣ/ than in normal speech. This is surprising, considering that a hard /ɣ/ is regarded as the more standard form in the Netherlands (Van de Velde et al., 1997). An explanation for this result might be that heavy scrape sounds rather harsh, even for the Randstad group, when speakers pay attention to their pronunciation. However, the differences between the two tasks were not greater for participant E3 than for the control group, so we can again conclude that the degree of convergence does not depend on register.

The question that remains is whether within-group variance can be explained by sociolinguistic factors, as was hypothesised for the second sub question. Firstly, we need to determine why participant E4 had converged in his realisation of /v/, while other participants had not. Possibly, the period of residence is a relevant factor. In contrast to participants E1 and E2, who had lived in Utrecht for a year or less, participant E4 had lived in Utrecht for more than three years. The same was the case, however, for participant E3. This participant had converged in his realisation of /ɣ/, but not of /v/. It should be noted that participant E3 states he had a uvular pronunciation of /ɣ/ before he moved to Utrecht and while he may thus have converged to some extent, he did not really make the switch from *hard g* to *soft g*. Another clear difference between participant E3 and the rest of the experimental group is how often they visit their families in Limburg. Whereas participants E1, E2 and E4 all go back nearly every week, participant E3 goes back about twice a month, which may explain the fact that only E3 has converged in his pronunciation of /ɣ/.

Finally, it is possible that attitudes play a role. Whereas participants E1 and E2 were hesitant to express a preference, participant E4 stated that he preferred a “neutral” accent and highlighted the negative associations of a Limburgian accent. The same explanation can be given for the phonetic convergence demonstrated

by participant E3, who had adapted a uvular articulation of /ɣ/, of which he was conscious himself. In his interview, this participant gave a slight preference for a Randstad pronunciation, because it “helps you become part of your surroundings in Utrecht”. He also expressed the belief that people may be negatively prejudiced towards Limburgian accents, which would make you sound “dumb”. These language attitudes, or even beliefs about other people’s attitudes—which most participants discussed—may thus form a deciding factor for phonetic convergence.

The collected data, specifically the sociolinguistic interviews, may also be used for further research on other linguistic variables, such as the pronunciation of /r/, which had clearly changed for one of the participants. It should be noted that the experiment described here was a pilot study, which could be elaborated on by, for example, recruiting more participants and adding a control group of students who were raised in Limburg and are still living there. However, the best research design would be longitudinal such that individual realisations can be tracked.

## 7. Conclusion

This study investigated the realisation of /v/ and /ɣ/ by students living in Utrecht, comparing students who grew up in Limburg to students raised in Utrecht, to see if the pronunciation of the Limburg students had converged. Analysis of a word reading task and a sociolinguistic interview indicated that, while the experimental group in general had not converged for /v/ and /ɣ/, one participant had converged for /v/, devoicing more often than other participants of the experimental group. This finding is likely related to the period the participant had lived in Utrecht, although other factors such as attitudes are also suggested to play a role. Another participant had converged towards the Randstad accent regarding the uvular realisation of /ɣ/. The convergence of /ɣ/ could largely be explained by how often students returned to their families in Limburg, in addition to beliefs about attitudes towards accents. The current pilot study thus provides some evidence suggesting long-term convergence but also notes various factors convergence is dependent on besides interaction with speakers with another accent, including attitudes and the strength of connections to students’ home towns. However, further research is needed to corroborate these preliminary findings. ■

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